STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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February 22, 1999

Mr. Emil Klawitter
Code 1823 EK
Department of the Navy, Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop 82
Lester, PA 19113-2090

Re: Monitoring Event 12 – July 1998, Sites 1 and 3 and Eastern Plume, Naval Air Station, Brunswick

Dear Mr. Klawitter:

The Department of Environmental Protection (DEP or Department) has reviewed the report entitled Monitoring Event 12 – July 1998, Sites 1 and 3 and Eastern Plume, Naval Air Station, Brunswick, dated October 1998, prepared by EA Engineering, Science and Technology. Based on that review the Department has the following comments and issues.

General Comments:

1. As stated in recent technical meetings by DEP and Lepage Environmental, potentiometric contour maps are needed that show a complete progression of contours around extraction wells that are creating substantial drawdown. Even if data on where to draw the contours is scant, the concept of relatively steep "cones" must be portrayed. Small inset locality maps may work. A larger scale map in the EW-2A area is critical to include in future Monitoring Event Reports.

2. The most important page in the report, Figure 10 (VOC distribution map), has a number of minor problems (see comment 17). The Department also sees a problem regarding the depiction of VOC distribution with respect to existing monitoring wells. (Also see comment 18). MEDEP would like to include this topic on the March 3 agenda.

Specific Comments:

3. Results, Section 1.2.2, page 4, 1st full sentence:

   "These observed conditions at MW-217A are caused by the anomalous water elevations noted at MW-217A during the May gauging."

   It is unclear by this statement as to the cause and effect between casing damage and water level elevations. Please rewrite.

4. Field Activities, Section 1.3.1, page 4, 3rd para:

   Three sampling locations were removed from the long-term monitoring program as of Monitoring Event 7: P-111, P-112, and P-132.

   Because the three piezometers were removed from the sampling program after Monitoring Event 7, restatement is not necessary at this point in the program. The sentence should be deleted.

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5. Sites 1 and 3, Section 1.3.3.1, page 5, 3rd bullet:

"Elevated dissolved oxygen concentrations approaching saturation (>9.0 mg/l) were noted in 3 wells at Sites 1 and 3: MW-203, (11.20mg/L) MW-204 (13.41 mg/L) and MW-219 (9.60 mg/L)."

It is equally important to list those wells in which dissolved oxygen in the groundwater sample is abnormally low, as very low values may indicate biodegradation of plume contaminants. It looks like a criterion of less than 2.0 mg/L may be appropriate.

6. Eastern Plume. Section 1.3.3.2, page 5, 2nd bullet:

See comment 5 above.

7. Ground-Water Extraction and Treatment System, Section 1.3.3.4, page 6, bullet:

"Elevated dissolved oxygen concentrations were recorded in the combined effluent, which is likely attributable to aeration and mixing, and the addition of hydrogen peroxide in the ultraviolet/peroxidation system, located immediately upstream of the effluent sample port."

The dissolved oxygen concentration measured in all extraction well samples except EW-1 and EW-5 also seem abnormally high, and likely is above saturation at the ambient groundwater temperature. EW-1 and EW-5 were being pumped at the lowest rates on the sampling day (July 17).

An explanation for the high values for EW-2 through EW-4 should be added, if possible.

8. Sites 1 and 3, Section 1.3.5.1, page 8, last two bullets:

The Department does not see the need for these bullets. The second to last bullet in the section is a general statement summarizing more detailed information presented already presented. The last bullet was more appropriately presented in Section 1.3.3.1.

9. Perimeter Monitoring Wells, Section 1.3.5.4, page 9, bottom bullet:

"One perimeter monitoring well located in the southeastern portion of the Eastern Plume (MW-311) reported concentrations of 6 VOC above corresponding State MEG or Federal MCL."

It is now apparent that MW-311 is not located at the edge of the plume (the definition of a perimeter well that was adopted at the Feb 10, 1999 technical meeting). The Department recommends that this well not be included in this section of the report.

10. Monitoring Activities, Section 1.5.1, page 12, 2nd para:

"Completion of necessary repairs to the landfill cap and drainage system will be completed in the Fall of 1998."

If the repairs were done, this should be stated. If not, a new timeline needs to be given.

11. Site plan for Sites 1 and 3 and Eastern Plume, Figure 2:

The Department again requests that the location of Site 2 be added to this figure, as was requested in comments on Monitoring Event 11 (see comment 20). It is important that the reader be aware of potential contaminant inputs to Mere Brook from the west side of its valley.

12. Interpreted Shallow Ground-Water Potentiometric Surface Contour Map, Figure 4:

EW-3 had a drawdown of approximately 14 feet on this date, although none of the map's three foot contours surround the well. Map Note 4 says this is due to the small scale of the map. However, the 24-foot contour could be wrapped around EW-3 without violating contouring rules, and thus visually indicate that EW-3 pumping does create noticeable drawdown.

13. Interpreted Shallow Ground-Water Potentiometric Surface Contour Map, Figure 5:

Map Note 4 infers much greater drawdown at EW-3 than this map and Table 4 data indicate. Please correct.

14. Interpreted Deep Ground-Water Potentiometric Surface Contour Map, Figures 6 & 7:

In this report as well as earlier reports, the deep potentiometric contour maps indicate a bulb-shaped low head area that parallels Mere Brook and runs to the Site 1 & 3 landfill area. The July 2, 1998 contours, in particular, infer discharge of groundwater within the 21-foot bulb. This feature appears strange, but has not been addressed by past comments. Two explanations could be advanced: (1) the landfill cap and head lowering within the slurry wall might be casting a downgradient shadow, or (2) underground features exist under the Weapons Compound that might cause a drain effect on groundwater.

However, the Department offers a more supportable explanation. We observe that water elevations in two monitoring wells (MW-218 and MW-220) are largely responsible for the 21-foot contour shown with a pronounced western protrusion. The screens in these wells are between 30 and 45 feet below land surface, and are about 10 feet deeper than the screens in their paired shallower wells (MW-203 and MW-210B, respectively). But, the drilling logs indicate that all four screens are above the first confining stratum. Therefore, while a significant downward gradient is evident at these well pairs, all four wells monitor the shallow groundwater zone.

The Department recommends deleting MW-218 and MW-220 from the deep potentiometric maps, and redrawing the 21-foot contour so it is centered on Mere Brook and does not encompass the Weapons Compound. If necessary, this can be discussed at the March 3rd meeting.

15. Interpreted Deep Ground-Water Potentiometric Surface Contour Map, Figure 7:

The measured elevation of the water level in MW-2A is –23.17 feet. This value should be added to the map. Also, EW-2A is shown with Note 5; however, this note does not apply to this well. Instead, a new note is needed that gives the contours of drawdown which in reality surround the well. Knowing the elevation in MW-311 (0.82 feet) at a distance of 50 feet from EW-2A, it seems possible to show some more contours on the map.

16. Interpreted Deep Ground-Water Potentiometric Surface Contour Map, Figure 7:

The closeness of the 18-foot and 21-foot contours between MW-207A and MW-105A does not seem realistic. No data exist to justify a spacing less than ¼ inch. The 18-foot contour should be moved southward to Mere Brook.

17. Interpreted Deep Ground-Water Total VOC Contour Map, 2 July 1998, Figure 10:

(a). The legend has a number of symbols that do not apply to this figure, and should be eliminated. An explanation is lacking of others (e.g., values inside of parentheses).

(b). This same situation also occurs on Figure 9.

(c). Why is the legend text the same for the stippled area and the 100 iso-contour?

(d). Extractions wells must be added to Figures 9 and 10.

(e). The value for total VOC for EW-2A appears above well MW-311, and without the EW-2A well symbol, it appears like a duplicate result.

18. Interpreted Deep Ground-Water Total VOC Contour Map, 2 July 1998, Figure 10:

The Department notes that in many places the 100 µg/L contour is the boundary of contamination inferred above MCL or MEGs. Of course, in reality the plume has a mappable fringe extending outside this contour. On this figure, several areas of the northern and southern plume lobes are shaded, and show that this fringe can cover a lot of area.

The problem is that this Figure 10 may under-represent the plume expanse, and therefore, is not conservative in regards to remediation needed. In the MW-311 area, the Navy is aware of this, and further data collection is under discussion. Some defensible basis for extending the stippled area beyond the 100 µg/L contour must be found. In order to confirm that remediation goals are being met, future mapping needs to reflect the solution to this current situation.

19. Interpreted Deep Ground-Water Total VOC Contour Map, 2 July 1998, Figure 10:

Units of measurement are missing for the total VOC contours.

20. Ground-Water Extraction Flow Rate and Run Time Summary, Table 5:

Flow rate values are shown as whole numbers, but include a decimal point and a zero for tenths. What accuracy was actually measured at each well? If readings are not accurate to the nearest tenth of a gallon per minute, the decimal and zero should eliminated.

Thank you for the opportunity to review this report. If you have any questions or comments please call me at (207) 287-7713.

Respectfully,

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